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TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—Preparation for Planting Trees.—The Beauty of Garden Flowers.—The Tulare Forest Reservation 449
Plan for a Small Town Place. (With figure.) 450
Color Notes on California Wild Flowers.—II. . . . . *C. R. Orcutt.* 450
A Suggestion from Nature . . . . . *H. B. Ayres.* 451
A New Enemy to Willows . . . . . *Professor John B. Smith.* 451
NEW OR LITTLE KNOWN PLANTS:—A Curious Form of Kalmia. (With figure.) *C. S. S.* 452
FOREIGN CORRESPONDENCE:—London Letter . . . . . *W. Watson.* 452
CULTURAL DEPARTMENT:—Notes on Shrubs . . . . . *J. G. J.* 454
Mulching . . . . . *E. P. Powell.* 454
Hollyhocks . . . . . *Phono.* 454
Sarracenias . . . . . *W. H. Taplin.* 456
Notes on American Plants . . . . . *F. H. Horsford.* 456
Dendrobium Findlayanum . . . . . *John Weathers.* 456
The Egg-Plant Blight . . . . . *Professor Byron D. Halsted.* 457
Chrysanthemums . . . . . *John Thorpe.* 457
THE FOREST:—The General Condition of the North American Forests.—II. *Dr. Heinrich Mayr.* 457
CORRESPONDENCE:—Wayside Beauty . . . . . *B. W. Barton.* 458
Shrubs on Tree Borders . . . . . *H. W. S. Cleveland.* 459
RECENT PUBLICATIONS 459
NOTES 460
ILLUSTRATIONS:—Kalmia latifolia, var., Fig. 56 453
Plan for a Small Town Place, Fig. 57 455

Preparation for Planting Trees.

THE placing of a young tree in the ground after all preparation for it has been carefully made is the work of a few minutes only. As a rule, the proper season for this operation in latitudes north of this city is in the Spring; but it is a fatal error to delay all preparation until April or May. These preliminary steps require time, and they should be taken with deliberation and care, so that it is not a day too early to make a beginning. In the first place, a careful study of the grounds should be made and the precise spot selected where each tree is to stand. The need for such a study would seem to be self-evident, but, as a matter of fact, the amateur too often waits to purchase his trees until the time for planting has actually arrived, and then he sends for a number of such varieties as he or his friends consider handsome, and after his trees have been delivered on the ground he sets about hunting places to plant them. Of course, in the rush and pressure of spring work everything must be done hastily and carelessly, and too often all the work is worse than wasted.

When the positions have been selected and the proper varieties of trees have been decided upon, it will pay the planter to visit some good nursery and make his own selection from among the growing trees of first-rate and thrifty specimens. He then can make his order intelligently, and he should insist that the trees he has chosen should be lifted from the nursery rows and forwarded to him as soon as possible after the leaves have ripened. Upon their arrival, any bruises which the roots have received should be carefully cut away and the young trees should be heeled in and left till spring. This operation should be performed as thoroughly as the act of final planting. A well drained place well sheltered from the wind should be selected, and fine mellow earth should be sifted among the roots and firmly packed about them. When practicable, a mound should be raised about the stems of the trees, and, if it is beaten smooth, the mice will rarely trouble them during the winter, as they do not like to climb up steep banks under the snow. When the trees are heeled in with care calluses will form where the roots have been cut and white rootlets will at once be thrown out in the warm earth, and they will furnish a supply of moisture to the trees and prevent their drying out in winter.

By all means the ground where the trees are to be finally placed should be prepared in autumn. This means that a hole should be dug to the depth of three feet, and if the trees are such as grow to a large size there is little danger of making it too spacious. No thrifty tree is in danger of having too much nutriment, and if the hole is five or six yards across no injury will be done. After it has been dug the loam should be shoveled back and the coarse stones picked out, so that in the spring the ground will have become firmly settled. If this work is delayed until planting-time, and a deep hole is then dug, the loose earth will settle away from the roots of the tree and leave air-spaces, which may prove fatal. In the spring small holes should be made in the centre of the large ones, but of ample size to contain all the roots of the tree without bending or cramping. The young trees should then be carefully lifted from their wintering-places, so that the fibrous roots will not be disturbed, and they should be set with all care, as has been often explained in these columns, special pains being taken to have the soil rammed compactly about the roots.

Of course, many trees are successfully planted in autumn; and it is often said that whether spring-planting or autumn-planting is to be preferred depends upon the season. If trees are planted in the fall they should be moved as soon as the leaves have ripened, so that young rootlets will form before the ground freezes. The plan here recommended, however, is safe in any year, and leaves the trees in the best condition to withstand a hard winter or a dry summer. There is nothing novel in the instructions given, and we repeat them now simply because the time is at hand when preparation should begin, and because every year brings a new crop of failures on the part of novices whose delays make success impossible. What is especially insisted on is that every single process in the planting should be done in season and done with care. This means that the planter should be able to give an intelligent reason in every case why a given species or variety has been selected and why it has been placed precisely where it stands. It means that no tree should be planted but a thrifty, well-rooted and carefully lifted individual, and that it should receive no check in transplanting, but continue in uninterrupted growth with every possible provision for, and assurance of, a long and vigorous life. Without such deliberate care every tree planted will be likely to prove a disappointment, which will grow more bitter as the years roll on. While, on the other hand, every tree which is planted as it should be, and which is full of joyous life from the outset, will prove an enduring and ever-increasing source of comfort and satisfaction.

IN *Harper's Magazine* for September Mr. Hamilton Gibson's pen and pencil once more invite us out-of-doors to the wild gardens of Nature's own planting. Very beautiful are the pictures of Cypripediums, Lupins, Pyrolas and the rest, and very pleasant are the artist's sympathetic descriptions of these wildings and their ways.

But is it not possible for one to make room in his affections for the flowers of the garden as well as for the flowers of the wood-side and way-side? Mr. Gibson seems to doubt this, and he even stigmatizes as a "pagan marplot" the gardener who had succeeded, as many others have done, in flowering a hybrid Lady's Slipper of his own production.

Of course all hybrid Orchids are not more beautiful than their parents, and some are not beautiful at all. Of course such objects can never have the particular kind of charm which invests a bit of Nature's handiwork chanced upon out-doors. And, of course, a man who devotes himself to hybridizing Orchids or anything else may become so proud of his results as to lose sight of their relative

importance in the vast sum total of flowering plants. But, after all, we cannot have too many beautiful flowers, and many very beautiful ones, which we should not otherwise have had, have been given us by the hybridizer. Moreover, his labors have largely helped the botanist to read the riddles which attend the descent and affinities of wild plants; and, if this is so, it is simply because the hybridizer follows Nature's own lead. Nature herself is the great, persistent and inventive hybridizer, as any one may discover if he will try to study our Oaks, for example, our Willows, or Orchids themselves. If we do well to scorn the gardener who can see no interest in "the wild garden of innocence and peace," are we not equally open to criticism if we find no beauty in the infinitely varied products of the seed-bed and the propagating-house? Could Mr. Gibson have known without the hybridizer's telling which of the Cypripediums he saw were man's hybrids and which Nature's? And if not—or even if he could—why might not each challenge admiration on its intrinsic merits?

No doubt it is a degenerate taste which sees no charm in the modest flowers which open trustfully without any care of man, and writers like Mr. Gibson, who invite us to the nooks where they are hiding, are doing a worthy service. But an affectation of simplicity of taste may be as undesirable as other affectations. Cultivated flowers do not lack beauty; many of the flowers of artificially produced hybrids do not lack beauty even when growing in the "degenerate precincts" of the hybridizer's garden.

It is hardly a month ago since we called attention to the danger which threatened the last remaining grove of Giant Sequoias in Tulare County, California, and expressed the desire, which must have been shared by every public-spirited person in the country, that this forest should remain the property of the nation forever. The most that could have been reasonably hoped was that Secretary Noble would withhold this land from entry for a time until public opinion became sufficiently strong to make it possible to secure some protective legislation. But a bill to set apart this grove as a public park forever was at once introduced into the House by General Vandever, and it has already passed both Houses by unanimous consent. The reservation not only includes the particular township first named, but certain other outlying forest-lands, and especially some in which are the fountains of the streams which flow through the principal grove. By this act the park is placed under the exclusive control of the Secretary of the Interior, whose duty it shall be as soon as possible to make and publish rules for its care and management. It is enacted that these regulations shall provide for the preservation from injury of all timber, mineral deposits and natural curiosities within said park, that the reservation shall be maintained in its natural condition, and, also, that the fish and game within its boundaries shall be protected from capture or destruction for the purpose of merchandise or profit. Provision is made for the erection of such buildings as may be needed to accommodate visitors upon leases not exceeding ten years of parcels of ground not to exceed five acres.

The proper management of this reservation, however, is a matter of future concern. The cause for congratulation is that there is now no danger that this last remnant of the race of colossal trees shall be given over to destruction. And now, why should not a similar reservation of Redwood forest be made somewhere in the Coast Range? These trees are even more beautiful and almost as interesting as the Big Trees, their relatives. Redwood timber is of such well known value that it is rapidly falling before the axe. In a few years these beautiful forests will be only a memory. It may be that there is no typical Redwood forest still remaining in the hands of the Government. If so, the state of California or some of the wealthy citizens of that state could leave to posterity no more enduring monument of their public spirit than the gift of a tract of Redwood timber with provision for its protection forever.

And have we not reason to hope that the Committees of Public Lands in both Houses, to whose efficient action the country is primarily indebted for the salvation of the Sequoia grove, may now be encouraged to report the Yosemite Park Bill? The success of the Tulare Reservation Act would seem to indicate that the sentiment of Congress in reference to matters of this sort is now altogether wholesome. The Yosemite bill can be passed at this session if the effort is only made with courage and confidence.

Plan for a Small Town Place.

In Garden and Forest for May 28th, 1890, we published outline plans of four small places, showing the importance of a skillful disposition of the house and other buildings with reference to special local circumstances. We present this week one of these same plans on a larger scale with the intention of showing the design a little more fully.

The place is not a new one, for the house, which is an old-fashioned, square, colonial brick structure, was built about fifty years ago, and the garden was laid out and planted at the same time. It had been long neglected and trees allowed to grow up and crowd each other so much that many were ruined, and they were so spread over the ground as to destroy all breadth. A few years ago, while alterations and additions were being made to the house, it was thought best to rearrange the garden at the same time, and, of course, the first thing to do was to thin out the trees and save the best of them, leaving in general a belt about the borders of the property to screen out neighboring buildings.

A low, broad terrace was thrown out on the east side of the house, lending dignity and support to it, and a wall was carried from the house to the street on the south, which completely enclosed the garden and made it retired, domestic and secluded.

As the house was distinctly a winter residence, this seclusion and protection of the garden was considered the more important, and for the same reason there were planted on each side of the circuit walk and about the borders of the property groups and masses of broad-leaved evergreen shrubs, mostly Rhododendrons, but also such plants as Andromedas, Kalmias, Mahonias, Daphne, Ledum, etc., to get variety and to gracefully edge down the masses.

It will be noticed that the house has two entrances: one from the street on the south, and the other from the paved court-yard on the north. This court serves also as an entrance to the stables and to the kitchens, which are in the "L" of the house, but so arranged as not to be obtrusive or disagreeable from the court.

The place is about two acres in extent, and is situated on flat, high ground in one of the larger cities of New England.

Color Notes on California Wild Flowers.—II.

One of the prettiest of the California wild flowers in June and July is the Chilian Canchalagua (*Erythræa venusta*). It is abundant in southern California on the mesas and hill-sides, and in the valleys, usually less than a foot in height, but in some moist localities exceeding two feet. The rotate corolla, with a slender tube and five (rarely four or six) divisions, exceeds an inch across, the divisions brilliantly colored, of a shade belonging somewhere between solferino and magenta, too dark for rose-purple, with a narrow white circle in the centre. The centre and the tube of the corolla, together with the rather prominent stigma, are of a greenish sulphur-yellow, the style and filaments white, while the prominent, exserted, erect anthers are of a brilliant lemon-yellow. The blossoms close their eyes upon the going down of the sun, turning their bright, dewy faces to him again in the morning. The flowers will remain bright and fresh for days and weeks after they are gathered without being put in water. This is one of its most excellent features, the value of which will be recognized by florists. Sometimes, though rarely, the divisions of the corolla are of a delicate pale lavender and often pure white in this species. The white ones are especially lovely when seen in a mass of the brilliant solferino. It will doubtless prove easy of cultivation, and if so, the California Centaury will become deservedly popular in American gardens. Medicinally the plant possesses valuable antiseptic and febrifuge properties, and is in high repute as a bitter tonic and stomachic.

Agave Deserti, one of the Mescal or Maguey plants, so abundant on the western borders of the Colorado Desert, produces

a stalk about seven to ten feet in height, surmounted with a large panicle of flowers of a chrome-yellow. The foliage is of a glaucous green.

Krameria canescens, also a denizen of the Desert wilds, is a low shrub about two feet high, bearing in spring-time a profusion of showy magenta colored flowers.

Læselia tenuifolia is a showy plant, of a span to a foot in height, which produces an abundance of flowers of a color somewhat difficult to describe—something between a poppy-red and a carmine, and very brilliant. This is related to the Phloxes and Gilias, and is equally worthy of cultivation as any of them. It is found abundant on the table-lands bordering the Colorado Desert on the west, in Lower California, and a few plants stray north of the boundary into this county. The altitude of its habitat is from four to six thousand feet. This herb is also credited with valuable medicinal properties, being held in high repute by the Indians and Mexicans, who use it in various diseases, especially in fevers.

In the mountains of Southern and Lower California there is a peculiarly beautiful form of *Calochortus luteus*, with flowers an inch and a half across of deep lemon-yellow, with a maroon-purple spot near the base of the petals. The glandural area is also of a maroon-purple, the space between being occupied with numerous lemon-yellow hairs. The scape is one to two feet in height. The plant is rare, growing very scattering in rocky places.

Mimulus brevipes has large, showy lemon-yellow flowers, and is one of our most abundant annuals.

Mimulus glutinosa is a shrub rarely more than two feet high, and produces in spring an immense mass of large buff-yellow flowers an inch and a half long, over an inch across, with two orange spots in the centre of the flower, the tube of the corolla white.

Dicentra chrysantha is a fine perennial plant, with delicate glaucous green, finely divided foliage, and producing a tall spike of flowers of a bright gamboge-yellow. It is not especially showy, but quite noticeable, and has long been in cultivation in Europe, where it is still in good demand. Like many others of our California wild flowers that have met with success in Europe, it still seems to remain unrecognized in eastern America.

Chænactis artemisæfolia is a rank growing, rather conspicuous and pretty annual with us, attaining a height of three or four feet, with wide-spreading branches, bearing numerous white composite flowers in balls an inch in diameter.

Sphæralcea Emoryi is a half-shrubby plant, one to five feet high, closely related to the Abutilons, with foliage of a sage-green, and showy, flame-scarlet flowers. It is easily cultivated and a very desirable plant.

Thamnosma montanum is a low shrub found on the mountains bounding the Colorado Desert on the west. It has a very pungent, spicy odor. The yellowish bark of the nearly leafless plant is prettily set off by the numerous prune-purple flowers, which fade to white.

Astragalus Purshii, var. (?) *coccineus*, *Parry* (*West American Scientist*, vi., 9-10), is one of the most beautiful and showy of the genus, producing a profusion of handsome scarlet flowers. It is confined to the same region as the last, and is probably the last plant to receive its name at the hands of the late Dr. C. C. Parry. It is scarcely a span high, the stems and foliage covered with a dense white tomentum, and forming a rather broad, compact mass, which wonderfully enlivens the rocky or sandy places where it grows with its large and showy flowers. It is the most worthy species of the genus in Southern California for extended cultivation.

Monardella lanceolata is a showy annual of our mountains, producing masses of bright Phlox-purple flowers. It is six inches to a foot high, branching, with a strong but pleasant Pennyroyal perfume, and is well worthy of cultivation.

Orcutt, California. *C. R. Orcutt.*

A Suggestion from Nature.

OBSERVING planters can often find instructive hints as to the arrangement of trees and shrubs by studying the ways in which they naturally group themselves in certain soils and exposures. Before our camp to-day lies a small island, which may be taken as the type of very many similar ones in the "park region" of Minnesota, and any landscape-gardener who has a littte island to cover with foliage could gather some fresh ideas for his work by taking note how Nature has done hers.

The beach of the island is sand on clay. The interior rises some ten feet above the water and is gravelly. In the shallow water are Bullrushes; dense near the shore, and the shore itself is bordered with a circle of pale Willow-bushes. Inside the Willows is a circle of Alders, a little taller; then a circle of Birches, with occasional dark spires of Fir; then Elms, with a central dome of Norway Pine.

Other islands of the type, but smaller, have circles of Spiræa, Willow and Maple, with a group of Elms or a single drooping Elm forming the dome. Some have a single White Pine in the centre; some a group of Firs or a White Spruce.

It should be borne in mind that Fir, Spruce and White Pine require damp subsoil, and in nature are brushy underneath, while the Norway Pine grows best on dry ground, and as soon as a roof is formed the lower branches drop off and a yellow carpet of the leaves is spread underneath.

Caribou Lake, Minn. *H. B. Ayres.*

A New Enemy to Willows.

EARLY in the present year I called attention to the imported Elm-borer (*Zeuzera pyrina*), which is now known to extend from New York City to beyond Newark, as a danger to our Elm. The present season has brought into notice, as a danger to Willows, another imported insect, this time a beetle, known as *Cryptorhynchus Lapathi*. It is one of the snout beetles of which the white Pine weevil is a shining example, and the injury to Willow is in appearance much like the injury to Pine. The beetle is black in general color, about five-sixteenths of an inch long and nearly half as wide, with the ends of the wing-covers a rich pale pink, an oblique shoulder stripe of the same color and the thorax also with pinkish lines above. There are five tufts of elevated black scales on the thorax and a linear series on each wing-cover, which are quite prominent and readily identify the insect. Altogether it is rather a pretty species, the legs being also banded with pink. The beetle makes its appearance in June and July, and lays its eggs in the branches, and, sometimes, also the stems of young Willows, apparently very close together. The larvæ hatch the same fall, burrow into the wood until the branches are honeycombed in every direction and change to a pupa in May or June. Samples of infested branches shown me contain burrows as closely run as the wood will sustain, and in the neighborhood of Newark, I am informed, many Willow clumps have been entirely killed off.

The first notice of this species in America was by Mr. Wm. Jülich, of New York, who in 1887 published the appearance of the species near Hoboken, New Jersey, in Willows there, and mentioned that isolated specimens had been found previously in Hoboken and on Staten Island. Since that time it has been found more frequently, and in the summer of 1889 a single specimen was taken near Newark, where previously none had been found. Early in 1890 the Newark collectors noticed the dying Willows and bred numerous specimens of the beetle from infested branches. In Staten Island it has also increased and multiplied and bids fair to become a serious pest. In Europe the species is a Poplar feeder, and probably this tree will not be exempt here when the insect is thoroughly domesticated.

There is only one treatment possible for this pest, and that is cutting all infested branches and burning them to prevent the maturing of the beetles. The cutting should be done early in spring, when the infested branches are most easily recognizable, and the remedy should be thoroughly applied. A tree once attacked will be eventually killed if the beetles are allowed to breed freely or if the knife is not thoroughly used. It is a small measure of comfort to know that the insect has brought with it a parasite which may eventually succeed in obtaining control; but at all events we seem to have fairly domesticated with us another emigrant which may prove as serious a pest as the Elm-leaf beetle.

Rutgers College. *John B. Smith.*

Buildings should not stand alone in open ground, lest they have the effect of spots, and appear foreign to the nature around them and not as if they grew in it. It is in the highest degree important that they should be in keeping with the landscape. Buildings within a park are only parts of a whole; and they must be designed with just as much regard to the view of them as to the view from them. A certain irregularity in park buildings is to be desired, as more conformable with nature and more picturesque. Buildings half hidden behind each other, large and small windows in the same wall, door-ways unsymmetrically placed, projecting and retreating angles, now and then a high bare wall with a rich cornice, isolated towers, widely overhanging roofs and balconies unsymmetrically set; in short, everywhere a striking but far from inharmonious irregularity, which expresses imagination, while yet the motive for every departure from regularity either appears at once, or may be divined.—*From Pückler-Muskau's "Andeutungen über Landschafts-gärtnerei," 1834.*

New or Little Known Plants.

A Curious Form of Kalmia.

THE monstrous form of Laurel (*Kalmia latifolia*), figured on page 453 of this issue, was discovered a few years ago by Miss M. Bryant in a large natural Laurel-thicket near Deerfield in Massachusetts. The attention of the public was called to it by Dr. Asa Gray, to whom Miss Bryant submitted specimens, and who published in the *American Naturalist* (iv, 373) an account of this freak of nature in a note entitled "Dialysis with Staminody in Kalmia latifolia."

The monstrosity consists in the division of the ordinarily five-lobed, saucer-shaped corolla into five narrowly linear or sometimes nearly thread-shaped petals alternate with the calyx-lobes. They are ovate at the base and by the revolution of the margins become sometimes almost thread-shaped above and so resemble filaments, the resemblance being increased by the fact that these petals are occasionally tipped by a single abortive anther. The plant, therefore, serves as a capital illustration of one form of dialysis and possesses considerable interest to morphologists. The pouches on the inner surface of the corolla peculiar to Kalmia, which receive the anthers before the flower-bud expands and hold them back until freed by insects visiting the flower, thus insuring cross-fertilization, are rudimentary in this abnormal variety and are represented by a slight depression on the inner surface and a corresponding boss on the outer surface of the petals. The stamens are normal except that they are erect or at length somewhat recurved with anthers entirely free. The pistil is normal and the plants produce seed freely in cultivation.

One of the two or three plants discovered by Miss Bryant was introduced into the Arnold Arboretum, where it flowers regularly every year and produced the specimen from which Mr. Faxon has made the drawing which re-appears in our illustration.

The casual observer seeing the plant in flower would never guess that it was a Kalmia. The flower certainly is not as beautiful as that of the normal Kalmia, one of the most beautiful of all flowering plants. They are very attractive, however, both before and after expansion. This plant, which flowers very freely, is well worth cultivation, therefore, not only as a curiosity, but as an ornament to the garden. It can be propagated by grafting on the normal form of the Kalmia. *C. S. S.*

Foreign Correspondence.

London Letter.

Protection for the Originators of New Plants.—This was the subject of discussion in *The Garden* and other London papers two years ago. Mr. T. Francis Rivers, whose fame as a raiser of new fruits of sterling worth is world wide, started the discussion by stating a very strong case in favor of protection, and suggested that a reasonable time should be allowed for the raiser to keep a right of property in his invention. When Mr. Rivers complains that seedling fruits raised by him and recognized as being worth planting for industrial purposes have yielded only a very unsatisfactory return, we are bound in fairness to ask if this kind of thing cannot be remedied. Difficulties of a serious kind were pointed out in the discussion which followed Mr. Rivers' letter, and these are emphasized in the leader in Garden and Forest for July 30th. The weight of opinion is, on the whole, against protection. Abuses which would prove probably far more intolerable than unfairness to the raisers of new plants would be the inevitable result of any attempt to protect the latter. In the case of new plants introduced from some other country, protection would rarely be of much avail, unless the introduction of the same plant by any one except the holder of the copyright were forbidden. The temptation to use the name of a valuable new plant for a counterfeit would, as you suggest, be strong, but on the theory that the Rose by any other name would smell as sweet, a copyright plant with a non-copyright name would soon find a market if deserving of it.

After all, the give and take principle must be fairly satisfactory to dealers in new plants. If Mr. Rivers finds that his new Plums are a source of considerable profit to many who have speculated in them, he can, on his part, do likewise with the new Grapes or new Apples raised by somebody else. From the point of view of the consumer it must be an advantage to have, let us say, a thousand propagators scattered all over the world diligently working up as rapidly as possible a stock of a new and improved fruit or vegetable or flower rather than to be compelled to wait until the copyright had ceased. That the bulk of growers would wait rather than pay a high price is shown by what is done in the case of those articles where protection is afforded. That the nation, as a whole, is a gainer where there is no protection is a political belief which I think applies in this matter of plant distribution.

Schubertia grandiflora, so well figured in Garden and Forest, page 368, is a most useful summer-flowering climber, as it grows and blooms freely under the most ordinary treatment. In the stove it is trained along a rafter, which it completely hides with healthy green leaves and numerous clusters of ivory-white, Stephanotis-like flowers; in the same house it forms a good specimen plant when the shoots are trained over a balloon-shaped trellis. In addition to these uses we have it trained along the roof of a greenhouse, where it has flowered well all summer. Evidently this plant is as accommodating in its requirements as its near ally, *Physianthus albens*, which also may be used either in the greenhouse or stove. Cuttings of the Schubertia have not readily struck root here, but seeds have been ripened from which a stock of young plants have been raised. *Physianthus albens* also fruits freely here.

Begonia Haageana is a most ornamental flowering plant for the stove. It grows to a height of about three feet, has large, handsome foliage, and produces all summer numerous broad, semi-drooping racemes of large pale flesh-colored flowers. It was introduced from Brazil by Messrs. Haage & Schmidt three years ago, and was figured in the *Botanical Magazine*, *t.* 7028, as *B. Scharffiana*. Several large specimens of it are now the most attractive of all the evergreen Begonias in the Kew collection.

Ixora macrothyrsa is this year again very fine at Kew. The heads of flowers are as massive as the largest heads of *Hydrangea hortensis*, and they remain fresh almost as long. Their color is a deep crimson.

Passiflora Kermesina (Raddiana) is a very effective climber in the stove; and it is as easy to cultivate as the commonest of Passion-flowers. For small houses it is particularly useful, as it requires only a square yard or so of space to make a good display of bloom. Trained loosely along a rafter so that the shoots may hang downward when clothed with its pretty carmine flowers it produces a pretty effect. The leaves are medium in size, three-lobed, and colored dark green above, deep claret below. The species is a native of Brazil, whence it was introduced into England sixty years ago. *P. Loudoni* is a cross between it and *P. racemosa* (princeps), and *P. Kewensis* between it and *P. cærulea*.

Cattleya Hardyana is perhaps the most gorgeous colored of all Cattleyas, as is indicated by its being supposed a wild hybrid from the very fine species *C. aurea* and *C. gigas*. It is imported with *C. gigas*, which it resembles exactly in pseudo-bulbs and foliage, so that a newly imported *C. gigas* may possibly prove on flowering the much coveted *C. Hardyana*. Recently this plant has attracted a good deal of attention. It appears to have one bad fault, namely, the liability to fall a prey to that mysterious disease which too often attacks and suddenly destroys *C. Dowiana*. Plants of *C. Hardyana* are sometimes shown at the meetings of the Royal Horticultural Society, where they are always much admired. There were several at the meeting held this week, and along with them a very similar Cattleya called *C. Massaiana*. This is said to be a natural hybrid from the same parents as *C. Hardyana*, and whatever their origin the two are certainly very much alike. The former has the sepals and petals colored a pale rosy salmon and a large lip fully three inches across, shaped as in *C. Dowiana*, its color being rich maroon-crimson in front, with a pair of broad patches of yellow and veins of the same color running into the throat. The plant worthily obtained a first-class Certificate. Plants of ordinary *C. Dowiana* have been sold for this beautiful Cattleya. Flowering at this time of the year these plants are particularly useful. I might mention that there is a tendency amongst Orchid fanciers to call all deep colored varieties of *C. gigas* forms of *C. Hardyana*. The former is a magnificent Orchid, but it lacks the beautiful gold penciling on the lip, so conspicuous a character in true *C. Hardyana*.

Dahlias.—There were some good flowers of these exhibited at the last meeting of the Royal Horticultural Society, chiefly

from the nursery of Messrs. J. Cheal & Sons, Sussex, whose collection of Dahlias is a choice one. The most striking of the new kinds was a Cactus variety called Mrs. J. Douglas, the flowers large, of the Juarezii type, the petals curled and colored salmon, tinged and shaded with purple. Although not bright in color, it is a new shade in show Dahlias. Among single-flowered kinds the best shown were: Gulielma, pure white, margined with buff-yellow, a very pretty flower; Victoria, white, with a deep crimson margin; W. C. Harvey, flowers large and colored rich yellow, with an orange shade; Brutus, a rich crimson; Duchess of Westminster, white and elegant as an Anemone; Mrs. Cleveland, a clear terra-cotta, shaded with cerise; Primrose, one of the prettiest of yellows. Besides the Cactus kind called Mrs. J. Douglas, I noted the following as first-rate in color and form: Beauty of Brentwood, rich purple; Yellow Juarezii, clear canary yellow; Cochineal, rich crimson, with Juarezii itself, which is still unbeaten as a bright crimson. Amongst Pompone varieties I selected: Admiration, crimson with white tips; Don Juan, rich maroon; Golden Gem, bright sulphur yellow, and Hector, scarlet. These small flowered varieties are useful for supplying cut-flowers for the house. To produce effect in borders or beds the colors ought to be bright and clear, the dull colors being much less telling.

London. *W. Watson.*

Fig. 56.—Kalmia latifolia, var.—See page 452.

Cultural Department.

Notes on Shrubs.

A Late-flowering Lilac.—On page 165 of the present volume of Garden and Forest there is given an illustration from a photograph of a cluster of the blossoms of *Syringa Pekinensis*. Although the production of a second or late crop of flowers is a circumstance not unusual among some kinds of shrubs, it seems worthy of note that a plant of this species is now (September 9th) blooming freely at the Arnold Arboretum. The plant is upright in habit and about fourteen feet in height. It bore no flowers in June, which is the regular blossoming season of other individuals of the species. There are from twenty-five to thirty large panicles of flowers on the plant, the largest clusters being about a foot in length. Unlike their usual habit, these panicles do not all open their flowers almost simultaneously, only a few panicles being in blossom at any one time. The earliest of these were showy in the last week of August, and with cool weather the latest will not fully develop their bloom until the last week of September at least. The panicles are borne at the tips of this season's shoots. Some of them, as before stated, are a foot in length, and they average quite as large and fine, and are as fragrant, as any produced in the usual flowering season. Usually the second or late blooming of a plant is much inferior to the first. At a distance the great panicles of flowers of this Syringa might be mistaken for those of *Hydrangea paniculata grandiflora*, which is just now in its best condition. It seems too much to expect that the late flowering of this specimen of *S. Pekinensis* will prove to be a constant habit; but if it proved so it would be worth perpetuating, and would be a valuable acquisition among the late white-flowered shrubs which attain large size. Other plants of *S. Pekinensis* which flowered at the regular season, in the latter part of June, are producing an abundance of fruit.

Berchemia racemosa, a Chinese and Japanese plant, belonging to the Buckthorn family, opens its earliest flowers here during the last days of August. The rather large compound panicles of small greenish white flowers are borne on the ends of the shoots or lateral branches, and, although noticeable against the general mass of dark green foliage, they are not very attractive or showy. In this climate the chief claim to ornamental value of this plant is in its clean, smooth, dark green foliage, which forms a good covering to the stems. The leaves are ovate, usually somewhat pointed, and are from one to two inches long. The blossoms are not even so large as those of the common Buckthorn. The fruit has not been produced here. It is oblong, about the size of small peas, and is said to be quite showy and ornamental. The late flowering habit would prevent the fruit from maturing here before the early autumn frosts occurred. This species has not so far proved as hardy as could be desired, although there are probably some situations in this latitude where it might attain a fine size and development; and where, when it became old and well established, it would withstand the vicissitudes of our climate. It is a trailing or twining shrub or vine, having apparently more of the habit of the Bittersweets (*Celastrus scandens* and the Japanese *C. punctatus*) than any others of the familiar shrubs or vines of our gardens.

Under favorable conditions the stems would probably climb high into trees or other supports, but here they only attain a length of ten or twelve feet at the most, although they are very free growing.

The American representative of this species, the Supple Jack (*B. volubilis*) of the southern states, is hardly so well able to endure our winters as *B. racemosa*.

Arnold Arboretum. *J. G. J.*

Mulching.

THERE is really no tree or plant which is not benefited by mulching. It is not improbable that we shall yet come to a system of agriculture in which mulch will be used for Corn and Potatoes and garden vegetables. Experiments in that line have proved beneficial. The only question is, Will the expense and trouble be compensated by sufficiently larger crops? Taking into consideration the liability to droughts there is little doubt but we can devise methods of mulching that will pay. What we need now is statistics of losses and waste of our fairly estimated crops. We must then consider how much of this is preventable. I believe that the loss and waste of the fruit crop is at least one-half, and of the Corn and root crop one-fourth of the average. The fluctuation of prices is not the chief difficulty with the farmer; the point to aim at is securing full remuneration for work and expense by getting invariable harvestings.

But mulching has an application of very great importance in the planting of trees. No tree, under any circumstances, should be set without a foot covering at once. It is the one most important point in planting, more so than large holes and carefully set roots well pounded down. Pruning has less to do with the life and growth of the tree. I reckon that a Pear-tree well mulched gains three years over one that is not. Chip refuse, coal ashes, wood ashes mixed with waste, long manure, cut straw, old or waste hay, are all good material. Whoever has evergreens or an evergreen-hedge to set will find three-fourths of his success dependent on mulching, the other fourth on not letting the roots see the sun or get dried for one moment. I moved a hedge of twenty years' growth six years ago and did not lose one plant. It was well done in all respects, but I relied mainly on puddling and mulching.

We have yet to learn the value of mulch in the handling of flowers. Setting out bedding plants involves a loss and a set-back; but if mulched with a handful or two of coarse compost the loss is reduced to a minimum. In the western states gardening and orcharding require more attention to root protection than in the Atlantic states; but it is important even in the most moist sections. The secret of success with trees and shrubs is persistent mulching.

Clinton, N. Y. *E. P. Powell.*

Hollyhocks.

IN British gardens of all sorts and sizes the Hollyhock is a favorite plant, and its admirers and growers are by no means few. Taking it for granted that the same may be said of the Hollyhock in America, the following remarks, culled chiefly from a lecture recently delivered before the Royal Horticultural Society in London by Mr. James Douglas, may be of interest, and even of value, to American growers.

The Hollyhock, botanically known as *Althæa rosea*, is a very old inhabitant of English gardens, single and double varieties of it having been recorded as far back as the year 1597. Its introduction, however, according to Dr. Masters, was probably much earlier than this, and it is possible that it first appeared in the time of the Crusaders, who brought it from Asia Minor and the Levant. Gerard, who was born in 1545, mentions single white, red and purple varieties, and also double purple and scarlet forms, as growing in his garden; and Parkinson, who flourished a quarter of a century later, enumerates a much larger number of varieties, thus showing that the work of raising seedlings had been carried on to a great extent in the meantime. Since this period much progress had been made, and numerous varieties created, and a most remarkable thing was that many of the additions were owing to cottagers who had to work at their particular businesses from six in the morning till the same hour, and often even later, at night, but who, nevertheless, found time to look after their Hollyhocks and grow them to such perfection as to almost make a professional gardener envy their success.

The propagation of the Hollyhock is most easily accomplished by sowing the seed in the open border about May. When the plants are large enough to be easily handled they may be pricked out in the place where it is intended to flower them, in rows, about three feet apart, and four feet between each row. There are, however, other methods of propagating the Hollyhock, and one is by cutting off a leaf adhering to a portion of the stem, and containing an "eye" in the axil, and thus making cuttings, which will readily strike in a hot-bed. Another means is taking the shoots from the base, while root-grafting is also adopted to propagate the plants, a shoot being cut so as to fit into a corresponding cut in the root, and then securely tied round with matting.

The soil for Hollyhocks should be prepared early in autumn for the next year's crop, and should be made deep and rich. When the plants are placed in positions in spring they should be staked at once, so as to avoid disturbing them at a later period. When well established little attention is necessary, but if the best results are desired the plants should be regularly syringed with clean water. Directly any flowers begin to decay the petals should be at once removed, as, if allowed to remain and become mildewed, the seed-pods are apt to become affected and rot. The flowering and seeding period having come to a finish, the stems may be cut down to within six inches of the ground, after which the stocks may be dug up and plunged in a somewhat dry material, such as cocoanut fibre, there to rest for the winter. In the spring, all the shoots, except one, which spring from the old stock may be taken off for cuttings, and will soon strike in a hot-bed or frame.

As to the enemies of the Hollyhock the only insect which does much damage is red spider. An experienced gardener at once recognizes the presence of this pest by the leaves assuming a yellowish appearance. The best way to combat it is by washing the leaves thoroughly with a weak solution of soft soap. The Fungus known as *Puccinia Malvacearum* is a tiresome disease which attacks the Hollyhock at all stages of its growth. Mr. Douglas, however, found that when he left his plants standing out for two successive winters they were quite free from this fungoid disease, whereas afterward, only, which he thinks is far superior to such abominable mixtures as soot, soap and sulphur. Mr. Smith, a large grower of Hollyhocks, never grows his plants under any circumstances beneath glass, believing it to be a forerunner of the Fungus disease. His seeds are sown in the open air, and his cuttings are put into open borders, which, however, have a southern aspect. Should disease make its appearance at any time, and, indeed, to prevent its appearance at all, a mixture composed of one peck of soot, two pounds soft soap and one pound of flour of sulphur is used. The mixture is made in a

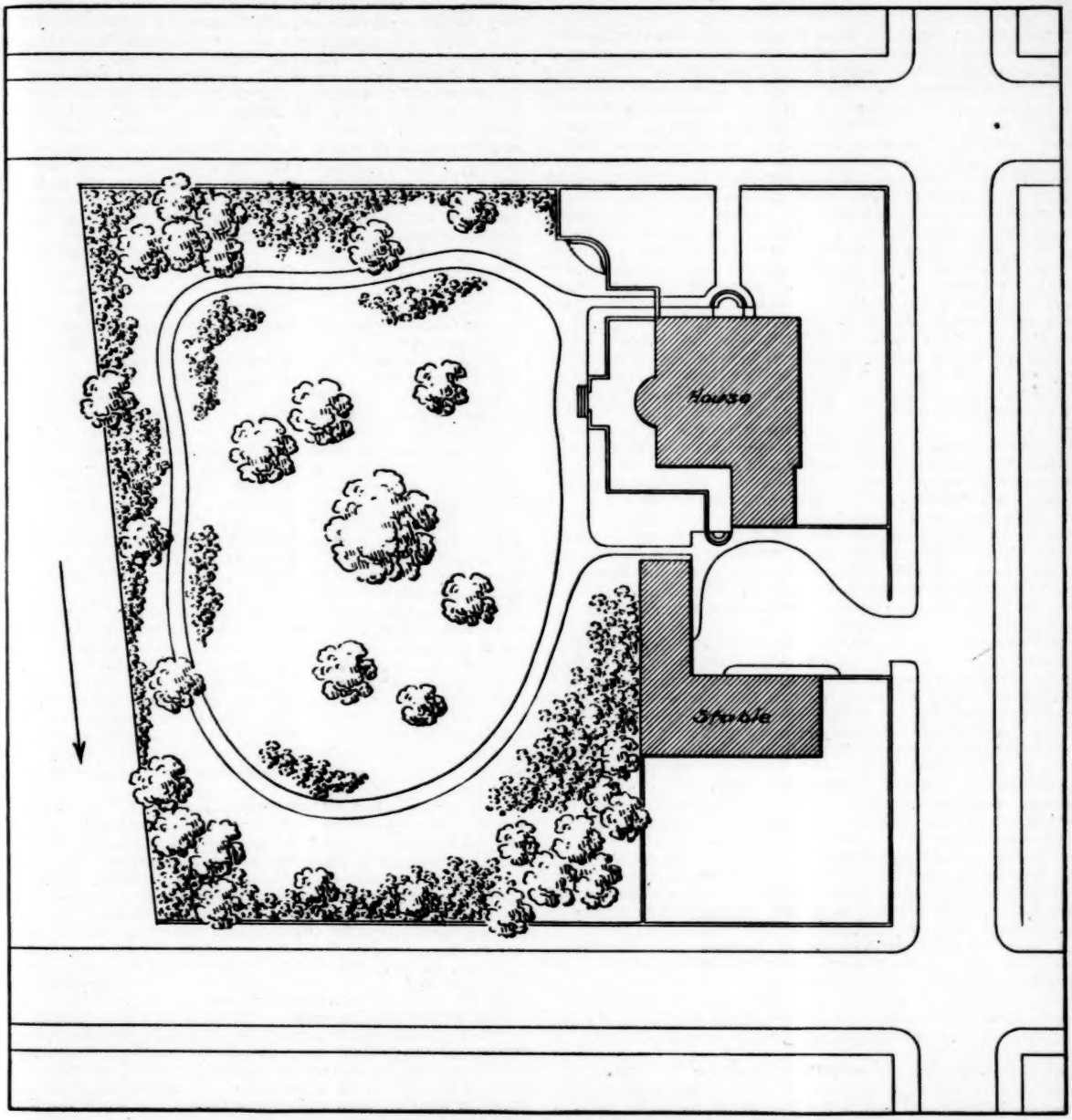

Fig. 57.—Plan for a Small Town Place.—See page 450.

when placed in a cold frame for the winter, the disease attacked the young shoots again in the following spring. It was combatted by taking off the affected leaves and painting the remainder with a solution of soft soap and sulphur. The inference to be drawn from this experiment is that if the plants are grown out-of-doors entirely they are free from the attacks of *Puccinia*. Recently Condy's fluid has been said to be one of the best destroyers of the disease, which it completely withers without in the least injuring the leaves of the Hollyhock, and Dr. Masters has great faith in sulphate of copper zinc pail with hot, but not boiling, water, and thoroughly well stirred. It is afterward strained through a canvas screen so as to enable it to be readily taken up by the syringe. Every day as soon as the buds begin to appear the plants are well syringed with the solution until the flowers open, and no sign of disease or thrips ever appears. Another disease hitherto not mentioned is known as the "white mildew." This appears during hot summers, attacking the stems, and in a few hours causing the leaves to droop and the flowers to become flabby. The only remedy for this white mildew is to cut off the stem

and burn it at once, otherwise the disease is liable to extend rapidly to other plants.

It is the same with Hollyhocks, however, as with other classes of plants—some can grow them with little trouble, while others, with the greatest care, cannot succeed so well as many cottagers. This was the experience of Mr. Cannell, of Swanley, who always found the disease get the best of him when he used to grow a quarter of an acre of Hollyhocks. He had tried all sorts of remedies, but failed.

London. *Phono.*

Sarracenias.

THE native Pitcher Plants, or "Side-saddle Flowers," as they are sometimes termed, are among the most interesting of bog-plants, and, when well treated, their curious foliage and quaint flowers give a pleasing variety in the arrangement of a cool house or conservatory. In general, they are not specially difficult to manage when under cultivation, the northern species, *Sarracenia purpurea*, of course, being perfectly hardy, while the various species belonging to the southern states will flourish in a temperature of about fifty degrees. The soil best suited to their needs is a mixture similar in character to that in which they are found in a wild state, this being usually composed of peat and living sphagnum, though under cultivation it is advisable that a liberal quantity of drainage material be placed in the pots or pans in which the plants are grown. In further imitation of nature a covering of live sphagnum may be placed on the surface of the soil, as this is not only an addition to the appearance, but also of benefit to the plants. An abundance of water during the growing season is, of course, necessary for the Sarracenias, and while as much is not needed during the winter, yet they should never be allowed to become actually dry. Some shade should be given all through the summer, and also free ventilation, for when kept too close and warm these plants are subject to the attacks of thrips, by which the foliage is soon disfigured. Enough variety can be found among the types to form the nucleus of a most interesting collection, to which may afterward be added some of the many fine hybrids obtained during late years.

Among the best of the typical species may be classed *S. flava*, one of the strongest growers, and producing its erect, funnel-shaped leaves or pitchers in profusion, some of the latter attaining a height of fully three feet. The pitchers of *S. flava* are bright green in color, while the flowers are light yellow or yellowish green, as the flowers differ somewhat in shade on different specimens.

S. Drummondii is another fine species of strong growth. A good specimen throws up its leaves to a height of three feet. These are also bright green in ground color, with the addition that the veining of the upper part of the pitchers is marked out in crimson, and the flowers are also dark crimson. This makes the plant entirely distinct from *S. flava*.

S. Drummondii alba is a most effective variety of the preceding, and is similar to the type in general characteristics, but distinguished from it in having the upper portion of the pitchers beautifully variegated with white. This is, doubtless, the best of the native varieties, and makes a fine specimen for exhibition purposes.

S. rubra is also a pretty species, though not quite as strong a grower as the sorts already noted. The pitchers are somewhat smaller and more slender in form, and they are veined and their upper portion frequently flushed with dull red. The flowers are quite dark in color and pleasantly scented.

S. variolaris is an odd-looking species, and has erect, hooded pitchers, winged in front and more or less marked with white. This plant bears a closer resemblance to the Californian representative of the Sarracenia family (*Darlingtonia Californica*) than any other species with which I am familiar, but it differs from the latter in having the true Sarracenia flower.

S. psittacina has some points in common with *S. variolaris*, chiefly in the shape of the pitcher, but *S. psittacina*, being prostrate in habit and much smaller in all its parts, is thus made abundantly distinct from it. To render it effective, *S. psittacina* should be massed in a large pan, and, for that matter, this is the most satisfactory way to grow any of the species, and with a little care they will make worthy ornaments for any conservatory.

The hardy pitcher plant, *S. purpurea*, may also be grown as a greenhouse plant, but under such conditions it seldom attains the rich reddish purple tint that is so admirable in the plant when growing in its native swamp, and it is, therefore, best that this species should be reserved for a snug corner in the bog-garden.

Holmesburg, Pa. *W. H. Taplin.*

Notes on American Plants.

ONE of the most interesting plants at this season of the year, on account of its fruit, is the White Baneberry (*Actæa alba*). The oblong racemes of white flowers, which come about the middle or last of May, are quite pretty, but at that season are not so valuable because so many other plants are in flower. But now its large, shiny, white berries, tipped with black, take the place of the flowers, and remain prominent a long time. It has the advantage of many other plants of this sort, for there is nothing to take its fruit. Birds never seem to eat the berries, and they are not inclined to drop off as soon as mature, as many others do. Its height varies from one to three feet, and it is not rare to see plants well fruited that are scarcely ten inches high. It likes the shade, a rich and well drained soil, and may be transplanted in either spring or autumn.

Zephyranthes candida, a fine representative of the Amaryllis family, was sent us from southern Texas. It comes from a medium-sized spherical bulb, which is covered with a thin coating not very unlike that of an onion. It seems to be a strong, healthy species, with numerous grass-like leaves a third of an inch or more in width. The large white flowers come later in the season than most of its class, which makes it the more valuable. They are nearly two inches wide and single at the summit of the almost naked scape. It is useful for cutting, though the stalks are not so long as those of the Cooperias. We have not tested its hardiness, but I suppose it would not stand much frost, and it is not necessary that it should, for these bulbs from southern Texas and Mexico winter very nicely in the cellar and are among the easiest of tender plants to manage.

Gentiana linearis, which was formerly known as *G. saponaria*, var. *linearis*, has a closed flower, usually over an inch long, of a light blue color. Its leaves are long and narrow, and the numerous simple stalks are from one to two feet high. Near the summit of the stronger ones are borne two to four light blue flowers. It blooms considerably earlier in the season than the common closed Gentian (*G. Andrewsii*), and its habitat is confined, I think, to peat bogs in partly shaded situations. Transplanted into light loamy soil in the shade it does finely, especially after it becomes established. It may not always flower the first year after transplanting, but if it is in a suitable location it will the second year, and will continue to thrive for a long time thereafter. It may be transplanted in spring or early autumn.

The common closed Gentian (*G. Andrewsii*) is already in many collections of our native wild flowers. It is a valuable hardy perennial, not difficult to manage, and does fairly well in either sun or shade, though shade seems to suit it best. A moist loamy or gravelly soil seems to suit. It may not always live, but there is seldom any trouble in its management. It is a more leafy and stocky plant than the former, of about the same height, but with shorter and wider leaves, and shorter and thicker, somewhat darker blue flowers. It likes a moist soil, but not too wet. It transplants well in either spring or autumn.

Aster acuminatus is a species which grows in cool mountain woods. Most plants of this species are not very showy, but in some favorable locations they bear an abundance of large light purplish flowers in wide, flat heads, and are very handsome. This Aster is usually only a foot or fifteen inches high, and in some of the finest specimens the flat heads or corymbs of flowers are nearly six inches wide. It soon forms dense beds, and if the soil is very rich and moist it may become almost a pest. It needs more time to become established than most species, and a partly shaded location is better than a sunny one.

Southwick, Mass. *F. H. Horsford.*

Dendrobium Findlayanum.—This is a very fine species and one easy to manage. The flowers, which, if spread out, would measure from three to four inches across from tip to tip of the petals, are produced from the upper portion of the stems, either singly or in pairs, on pale pink pedicels. The usual time for their appearance is about March and April, but it frequently happens that plants of *D. Findlayanum* will be found blooming as late in the season as July and August. The sepals and petals are pure white, with a purple stain at the tips; the former are oblong-lanceolate, and the latter oblong-elliptic, much broader and having a wavy margin. Comparatively speaking, the lip is large and roundish, the concave portion being deep orange-yellow, outside of which is a band of white decorated in front with a conspicuous stain of purple. To complete the description of the entire plant, the stems or pseudo-bulbs, which attain a height of twelve to eighteen inches, are remarkable for having each joint swollen into a pear-shaped or obovoid body, the attenuated base of which is

clasped by the sheath of an oblong-lanceolate acute leaf about three inches long and somewhat leathery in texture.

D. Findlayanum takes its name from a Mr. James Findlay who seems to have been the first European to discover it, about 1867, on the mountains dividing Burmah from Siam. Mr. Findlay called the attention of the veteran collector and botanist of Moulmein—Rev. C. Parish—to his find, and this gentleman in connection with Professor Reichenbach duly named and described it. It was not, however, until about ten years after its discovery that its first flowers appeared in England, this event taking place in the famous collection of Sir Trevor Lawrence, at Dorking.

The most convenient mode of growing this species is in baskets, which may be suspended from the roof within a foot or two of the glass, thus enabling the plants to receive abundance of light, which they enjoy. When the sun, however, is powerful the plants must be protected from its rays by means of shading. When the young growths begin to push forth, that is the time to begin increasing the supplies of water, and when they are approaching maturity the supplies may gradually be decreased, at the same time giving the plants as much air and light as is consistent with safety. The summer temperature may range from sixty-five to seventy-five degrees Fahr. during the day, and about sixty degrees at night, while for the winter these figures may be reduced by five or eight degrees.

Isleworth, London, W. *John Weathers.*

The Egg-Plant Blight.—The Egg-plant has been seriously diseased during the present year, and the crop is light from the inroads of a blight. Complaints have come from various sources, but nowhere have the losses been greater than in some portions of Gloucester County, New Jersey, where this crop covers large areas, and where market-growers sometimes plant as many as fifteen acres. A microscopic examination of the diseased and drooping, half-developed plant reveals a Fungus in the pale yellow leaves which, after sending its fine threads all through the tissue, soon concentrates in small areas and produces brown spots, over which are developed minute dark specks. These specks bear the multitudes of minute, colorless spores or reproductive bodies that are capable of germination and producing the disease in healthy parts of the same or other plant. The fruit upon the sickly plants is small, and before reaching half the normal size the skin turns brown in patches, followed by a dark pimply development of the surface, which ultimately spreads over the whole fruit. Before this, however, the fruit usually falls to the ground, and shortly becomes a soft, spongy, rotten mass. These decayed fruits, when left in the field, become the origin of infection for other fruits; for each pimple—and there are thousands upon the same "egg"—is a spore-bearing body, as are the black specks above mentioned as occurring upon the brown patches of the leaves. This Egg-plant blight or rot is closely related to the black rot of the Grape, and the same differences between leaf and fruit-form are manifest. The species is *Phyllosticta hortorum*, Speg., and belongs to a large genus of destructive parasitic Fungi. In the laboratory it has been an easy matter to propagate the disease from one fruit to another, the infection showing itself in thirty-six hours. There is but little doubt that by spraying the vines with Bordeaux mixture or carbonate of copper in ammonia the trouble can be checked.

Rutgers College. *Byron D. Halsted.*

Chrysanthemums.—It is about time to lift Chrysanthemums from the open ground. All plants should be dug around at least four days before removal, and a full week would be better. I use a sharp spade and thrust it in the ground around each plant in a circle, which about equals the circumference of the pot in which it is to be placed. The digging around cuts off the long roots, after which young fibres are formed within the circle, and they commence feeding at once. If the long roots are cut at the time of lifting the food supply is rudely checked, the plant wilts and often the buds are crippled. The disbudding of all plants should be proceeded with as soon as the buds are as large as Radish-seed. Do not shrink from thinning severely. On one growth of stem from the surface of the ground of a plant of Gloriosum I have to-day removed forty-seven buds, leaving seven. These will be reduced to five, or perhaps to three, before the time of blooming. The flowers will be not less than five inches in diameter, and will present nearly as much coloring as if the whole crop of buds had been left, but with this difference, that a few finely developed flowers will take the place of many puny ones. By the end of the month it will be necessary to have all Chrysanthemums where they may be protected in case of a sharp frost, which almost invariably occurs here between the 27th of September and the 8th of October.

Pearl River, N. Y. *John Thorpe.*

The Forest.

The General Condition of the North American Forests.—II.

THE visitor from Europe is particularly surprised at the extraordinarily long and numerous wooden structures which the railway train sets to vibrating in crossing the water-courses. In America the streams retain a freedom of movement of which they make full use; one year here, another there. From high mountains the bed of a stream looks like a broad white band of water and gravel banks, with green, wooded islands between.

Streams are a good indication of the state of cultivation of the surrounding country. Those which from year to year discharge their clear water into the sea, and through the year scarcely vary in their water-level, come from an undisturbed wood-land. Their banks are held fast by the roots of the trees in the region of the head-waters, and in the mountains the water gathers slowly from the woods. Such streams one sees now for the most part in uninhabited regions only; in the Island of Hokaido, in northern Japan, for example, I have found such.

Streams which during the rainy season or during the season of melting snow flow turbid, and during the rest of the time clear, showing in ordinary weather small variations in their water-level, rise in woodlands, and flow through arable land, part of the soil of whose roads and fields the rains wash into the streams. Of this kind are the streams of Germany and France.

Finally, streams which year by year flow with turbid water, or which, at least, through the rainy season rush through the cultivated plains to the sea with swollen floods, here carrying away soil, there heaping up gravel-banks, come from an up-country in which the forest is almost entirely wanting, or the deforesting is under full headway. Such streams one sees, for example, in Ceylon, where the English, with plantations of Tea, of Coffee and of Cinchona, have begun the destruction of the forests and the woodlands of the mountains. Such streams are numerous in Japan, Spain and northern Italy. There the streams are feared whenever it rains a few days longer than usual. The American streams approach this stage. In their unrestrained impetuosity they vie with each other in bringing ruin upon their bottom-lands, which, as a rule, contain the best soil. That a change must have taken place in a river is clear when during the rainy season it undermines its banks covered with trees that have stood for centuries, and finally sweeps them away in its floods. Instances of this are numerous in America, and speak plainly to every one who can and will see, more plainly than all the books upon the influence of the deforesting of the mountains and the plains upon the water-level of streams. The deforesting of the Adirondacks through fire and in useless attempts to take the mountains for agriculture, causes a perceptible change in the water-level of the Hudson, which during the dry season is fed with the moisture of the earth in the Adirondacks. Formerly Peekskill was a water station of the New York Central and Hudson River Railroad. This station had to be abandoned because during the dry season the salt water forces itself as high up the stream as Tivoli, and salt water is unsuitable for feeding locomotives.

Although the American engineer is familiar with the increasing variation in the level of the streams, one sees but few efforts to regulate their flow, which, indeed, would involve a mere waste of money, as long as the average level of high water is yearly becoming higher. Moreover, many look upon the deforesting of the mountains with indifference, because they believe that the forest, with its beneficent influence, can be replaced upon a magnificent plan. Their idea is to fill enormous reservoirs with water during the rainy season, and then to permit the contents to flow throughout the cultivated lands. But for the filling of such reservoirs a considerable surface of soil which may collect the rain is necessary. It is to be hoped that the rain will be so gracious as always to fall with due regard for human safety, for the breaking of the reservoirs might have worse consequences than a cloud-burst. To me it seems much safer that the great amount of money which permanent water-works would require should be utilized in buying up the mountain lands and preserving their forests. This would be good policy even without taking into account the fact that these natural reservoirs bring in money, while the artificial ones only swallow it up.

In spite of the outrageous management of the forest everywhere in the United States, I am inclined to believe that, partly of itself, partly with some little help, it will return to its beneficent condition, if in the future it should be possible to preserve it from fire. Danger of fire in the forests in the civilized part of Europe has become a rare thing; at the least fire every one hastens to put it out, and the Government has power to compel all to help.

In India the number of forest-fires is lessened yearly, thanks to the energetic measures of the Government and the watchfulness of an efficient body of foresters, while young growth springs up on the protected plains.

In Japan, a smaller country, fire and the axe have already nearly completed the work of destruction. The brave nation is laboring with the utmost zeal and with great outlay of money for the restoration of the forest on the shrub-covered mountain slopes, and for the preservation of what still remains.

In North America the practice of burning forests has become customary, even in cases in which it is entirely without reason. How can anything else be expected from the descendants of a nation that has no forest, and therefore knows nothing of the blessings of a forest? Closer study of the causes of the burning of the forests forms an instructive, if not an edifying chapter. We see what man can bring to pass in a country of such highly vaunted elbow-room, in a country where the most complete individual liberty seems to be the chief principle, in a country whose laws for forest-protection are empty threats, because the ignorant and unprincipled cannot be compelled to obey them.

According to the report of Professor Sargent, one million acres of forest were burned in a single year (1879–80), and with it twenty million dollars' worth of property was destroyed. The causes of these fires have been ascertained, as follows: 197 fires resulted from burning over pasture lands; in 1,152 cases fire started in making forest-clearings; 508 started from locomotive sparks; 628 from hunters' fires; 72 from camp-fires; 35 from pipes and cigars; 12 from prairie fires; 9 from charcoal-burning; 32 from lightning; 56 were kindled by Indians; 10 by lumbermen; 2 by tourists; 262 were kindled maliciously; in 2 cases fire is said to have been started by spontaneous combustion; 3 times wood-cutters and 3 times unknown carelessness set the fire. This makes a total of 2,983 cases.

Let us examine further the fires started maliciously and those caused by locomotives, hunters and campers-out, 1,470 in all. The injury that the railway does to the forest-interests is very serious. One who travels to-day in North America must grow accustomed to the charcoal heaps on both sides of the railway, if he would have any pleasure from the beauty of the landscape. From the railway the fire has encroached for countless miles upon the forest. Upon the oldest railways the danger of fire is reduced yearly by constant burning of the trees from the clearing on both sides of the road-bed. Upon such clearings it would be an easy thing to cut off the fire from the forest with a safety-ditch. It appears to me that there is no other expedient than to make a cleared belt along the tracks as soon as possible. At all events, this does more good than the spark-arresters which the law prescribes, since, in spite of all laws, the locomotives run without them.

A characteristic result of the boundless freedom of the individual at the cost of the people is presented in those cases in which hunters and tourists camping or traveling in the forest cause the fires. In the year 1880 they kindled 700. As far as my experience in western America extends, the sportsmen are careful to burn the under-brush, which in the primeval forest contains generations of future forest-trees, in order that they may be less hindered in their aim. In other regions the woods are fired in order that the game throughout particular districts may be driven together. Comment on this is quite unnecessary. Forest-thieves, too, start fires, especially in the Government forests, in order to obliterate the traces of their theft.

With reference to the Yellowstone Park, the possession and the pride of the whole nation, H. Winser says in his "Guide for Tourists":

"It is to be deeply deplored that because of the carelessness of campers-out, many of them cultivated people, vast stretches of forest have been destroyed by fire. The fires have resulted from neglect of the simplest precautions as to camp-fires. In consequence of this it is not at all unusual to be obliged to ride in the park for miles and miles between black tree-stumps instead of in the refreshing shade of the green forest. This thoughtless destruction of the forest should be checked by severe punishment of the offenders."

It should be provided by law that any one who causes a fire shall be held for the injury done, and the amount of damages should be equal to the value of the woodland destroyed. But the injury done to the forests by overthrowing confidence in the security of forest-property, by discouraging the investment of money in forest, by the destruction of the young growth, and by the effect upon the fertility of the soil would still remain without mitigation.—*From "The Forests of North America," by Dr. Heinrich Mayr.*

Correspondence.

Wayside Beauty.

To the Editor of Garden and Forest:

Sir.—The several articles upon "Country Roads" which have appeared in Garden and Forest we have chosen to receive as words of personal approval, so well has their sentiment chimed with the spirit which has been moving us to better and to beautify a short bit of road which leads us daily to the station on the one hand, and to the village, less than a mile away, on the other.

A very few years ago this road was at times so deep with mud that it would become nearly impassable, and farm wagons especially were compelled to make quite a long detour to reach the station from the turnpike or from the village. The neighborhood becoming more popular and more populous, and the demands for better roads increasing, the county officials were induced to take this particular piece of muddiness in hand. The grade was first improved by cutting, filling and ditching. There was then laid down a good bed of the rock most convenient to the locality and known even to the geologists as "nigger head." This is an extremely hard *gabro*, occurring mostly in nodular masses and very difficult to crush, but when once in place and tightened by the pressure of wheels it makes, by reason of its toughness, perhaps the best of road-metal. The neighbors now came to the front, and of their own means and motion they covered this rough stony bed with a layer of oyster shells of from four to six inches in thickness. These were rapidly ground up on and near the surface, the finer bits trickling through and forming a compact mass below. Last winter's observations showed us that to attain perfection, and to make a model of our hobby, we should have still further to raise the middle of our road-bed a few inches—this time instead of oyster-shells we determined to try crushed blue lime-stone, which we brought by rail from near Waynesborough, Pennsylvania, the railroad giving us special rates. Of this stone, broken to pieces the size of chestnuts, we made a last covering of about four inches in thickness. The road is now perfectly smooth and hard, and is nearly as white as when covered with the shells. This whiteness, to which some might object, is by no means glaring or disagreeable, as the road is mostly shaded. On the contrary, it is found to be very convenient by night in enabling one to keep the track.

In spite of repeated insinuations of untidiness, and, indeed, of outspoken demands for the use of the scythe and the axe, we have succeeded thus far in preserving vegetation quite undisturbed, with the exception of pruning some overhanging and interfering tree-limbs. On the ugly red slopes of a long cut, through which the road passes, and also on the face of a rather steep bluff, we planted a good lot of Chinese Honeysuckle. This has outdone expectation, and has given us the densest walls of green in place of the ugly scored banks which were continually washing down or sliding into the road-side gutter. The fragrance, too, of its flowers fills the air, as well as our senses, with its sweetness, and bees and humming-birds abound. The other trees and shrubs which border our lane are essentially our own—that is, are American—and occur in sufficient variety to give a caste to the seasons. The Spice-wood comes out with its small yellow flowers to insist that spring has really come, and warns us later by its red berries of the summer that's waning. Why is it, by the way, that this Benzoin, with its fine foliage and generally attractive habit, has not become more commonly domesticated? I have been pleased to see it named in Garden and Forest among other commonly neglected native shrubs as worthy of a place upon our lawns.

The Blackberry-bushes along our road-bank were this year simply charming. Owing to the mild winter their long reeds of last year were not killed back, but becoming covered with flower-shoots and bending gracefully away from the high banks, the effect was most unusually beautiful. Wild Grape-vines are smothering the life out of some decrepit Locust-trees, and are competing hard with Honeysuckle and Poison Ivy for every bit of space and light. Wild Cherry, Viburnum and Dogwood contribute their part in flowers and shade, each in its time, and a number of Sassafras-trees save themselves

for the dying year, when they flare out with their splendid foliage of crimson and orange. Charlock and Hedge Mustard have established themselves over certain areas, and are very brilliant when massed in flower; but the gardeners pass them with an evil eye askance, and sometimes come back with a scythe or hoe. Just now the Compositæ are beginning to have their day. The Bonesets, Sunflowers, Asters and Golden Rods are conspicuous. At one point the road is hedged in by a dense mass of the pretty Jewell-weed in full flower, and all mixed and matted by a rank growth of Bunch-weed, whose little clusters of white-winged flowers mingle becomingly with the yellow, dangling nectaries of the Balsamine. Such are the more noticeable details of vegetation which we have succeeded in letting alone, and which make of this oft-traveled road, for some of us, a never-ending source of pleasure and interest. Should we hope for as much of a well kept, tidy road-side? We are encouraged to believe that others are beginning to take the view of these weeds that we ourselves take, and still others, alas! are so indifferent as not even to wish to destroy. This at least gives us hope of saving our wild bank as Nature makes it for us.

Baltimore County, Md. *B. W. Barton.*

Shrubs on Tree Borders.

To the Editor of GARDEN AND FOREST:

Sir.—The short extract from Gilpin's "Practical Hints," in GARDEN AND FOREST of September 3d, page 426, touches a subject of vital importance in the development of landscape effect, which very few people appreciate as it deserves. The opening sentence gives the keynote of what I refer to: "Groups of large trees should be accompanied by shrubs to connect them with the lawn."

Any one who will look across a meadow or lawn at a line of wood the outer edge of which still retains its fringe of wild shrubbery presenting a mass of foliage impervious to sight from the ground upward, and will then contrast it with the more common case, in which all the shrubbery and low-growing limbs have been cleared, and the eye penetrates perhaps the whole breadth of the wood through a maze of bare trunks, will appreciate the superior beauty of the former. And yet, nine times out of ten, the first work of "improvement" on a new place is to set a gang of laborers to work at grubbing out all the wild shrubbery, and they always begin at the outer edge, where every leaf should be sacred.

I have grown tired of hearing the announcement from proprietors who seek my aid in developing the beauty of their grounds that they "have had all the underbrush grubbed out, so you'll have no difficulty in seeing through anywhere."

Many men, who have a genuine love of natural beauty, fail to appreciate this till their attention is called to it, when they acknowledge with surprise that they had never before analyzed the nature of the obviously superior beauty of a mass of foliage as compared with an open wood when seen across a lawn.

Minneapolis. *H. W. S. Cleveland.*

Recent Publications.

Report of the Division of Forestry for 1889. By B. E. Fernow.

It may be that there is an author's edition of the Report of the Chief of the Forestry Division for last year, but we have not seen one. It will be found, however, in the general report of the Secretary of Agriculture, and although it is not so long as usual, it contains much important matter, which should be read by every person in the country who has the interests of our forests at heart. If the Forestry Division should ever become an executive department, charged with the management of the forest-lands which belong to the nation, its duties in that direction would be clear. If, on the other hand, it is to be simply a bureau of information there is a question as to what particular kind of information it should acquire and disseminate. With the present appropriation the Department is unable to command the services of competent assistants, and, of course, such systematic work as was outlined in the report two years ago cannot be undertaken. In the absence of adequate facilities the work done by the Department has been in a certain measure desultory, although the investigation concerning the prospects of substituting metal ties for wooden ones on railroads is considered by Mr. Fernow to be highly satisfactory. The biological studies in regard to timber trees have been carried on, although slow progress has been made for lack of means. Mr. Roth, of Ann Arbor, has furnished a comparative study of the woods of three prominent southern Pines, and these will be printed, together with the monographs on the life-history of those trees. The monographs now on hand, and still unpublished, comprise the following species: The White Pine, by Professor S. V. Spalding; the Norway and Pitch Pines, by Professor William Flint; the Hemlock, by Professor A. N. Prentiss; the two Spruces (*Picea nigra* and *P. alba*), by Miss Kate Furbish; the Long-leaf, Short-leaf, Loblolly and Cuban Pines, by Dr. Charles Mohr. It is to be hoped that the publication of these studies will not be delayed, as they probably constitute the most valuable work which has been accomplished by the Division during the last three years. They are to be illustrated by wood-cuts of the highest order. Among the other work attempted during this year is a canvass among the railroad managers relating to supplies and prices of wooden ties; a canvass as to the needs of the cooperage industry, which uses two hundred and fifty million cubic feet of wood per annum, and the beginning of an investigation of the supply of timber needed for carriage-building; but the completion of the last inquiry has been deferred on account of lack of funds. Considerable labor was given to preparing an exhibit for the Paris Exposition and making forestry collections for the National Museum.

Mr. Fernow again points out the perplexities he experiences in distributing according to law "valuable economic tree-seeds and plants." Of course, tree-seeds, as a rule, do not permit of long storage, and must be carefully handled and rapidly disposed of, or they will lose their power of germination. Few people know how to handle the seeds except the kinds most easily grown, while the length of time before a plantlet will grow to a size fit for transplanting wearies the settler's patience. As might be expected, the reports from the seeds and seedling distribution of former years have been most discouraging.

A compilation which attempts to show the status of the forest-timber culture entries from the reports of the Land Office proves that the results are far from satisfactory. It may be that greater success will be gained from the entries of latter years, because of increased experience and because the timber-claim planting is now often done by contract by persons who make a business of it. Yet the consensus of unbiased testimony goes to show that this planting, as a rule, does not produce the results desired and has chiefly been used as a means of speculation in Government lands, either with this design from the outset or as a necessity after a failure to obtain land by timber-planting. Of course, there is some planting of wind-breaks and groves done on homesteads which have succeeded better, but the amount of tree-planting is infinitesimal, when compared with what is necessary to ameliorate the climate, and it may as well be admitted that the reforestation of the plains must be a matter of co-operative enterprise if it is not a national work.

Under the head of "Proposed Work," Mr. Fernow gives a condensed statement of what he thinks the character of the information should be and how it should be obtained if the Department is to continue simply as a bureau of information. In the first place, the Government needs information as a basis for action relating to its own timber-lands, and to enable it and the general public to appreciate the true relation of the forest-interests of the nation to its economical life. Again, consumers of forest-products need information which will help them to use the same economically and advantageously, and finally, the owners of natural woodlands need to know the best method of managing them for reproduction, and forest-planters need to know how to start and cultivate a timber crop. Government action can have no rational basis except carefully obtained and digested statistics, and statistics of forestry matters are among the most difficult to collect, and yet their collection is all the more desirable because of the difficulty of estimating and comparing present supplies and future requirements. But with the present organization of the division no comprehensive collection of accurate figures can be contemplated, however desirable and urgent such a work may be. Outside of these statistical inquiries there is a wide field for the study of our timber trees in the biological and technical direction. We are by no means certain as to the qualities of our timber trees and their adaptability to forest-uses, and still less do we know upon what conditions of soil and climate these qualities depend. Not only is the engineer and architect interested on this point, but the planter is as well; for he may be led to use a species which, while it may grow well in his locality, does not in the end develop those qualities for which it is most highly prized. We know very little, too, about the life history of timber trees, and this knowledge is the only basis of successful forestry. We have learned much about various trees in the nursery and their requirements for ornamental planting, but the behavior of these trees in the forest

differs greatly from their habit in the open ground, and as forestry means tree-culture for profit, it is essential that the relative growth of forest-species at different ages throughout their entire life shall be known, and at what age the most desirable quality and profitable size is reached. As an instance of the practical value of such knowledge Mr. Fernow calls attention to many plantations of Black Walnuts in the western states, which grew rapidly for ten or fifteen years, and have become since then a disappointment by their slow growth.

In order to settle many vexed questions in forest-culture and to obtain positive evidence as to the best method of planting, and the best timbers to use in arid regions, it is desirable to begin systematic experimental plantations. The co-operation of experiment stations now existing in treeless regions, as well as of private individuals who have special facilities, is therefore invited to establish such experiment plantations upon a uniform and centrally directed plan, and it is further suggested that the authorities in charge of the military reservations of the west be requested to aid in carrying out this plan.

To the report proper is added an interesting appendix on "The Influence of Forests on Water Supplies." We have no space for quotation here, but what has been discovered by careful investigation in other countries is very tersely set forth, and it hardly needs to be added that these figures do not confirm Major Powell's theories as to the destructive effects of mountain forests upon the flow of streams which take their rise among them.

Notes.

We have received the first number of the *Western Garden*, a new monthly journal of horticulture published at Des Moines, Iowa.

A meeting of the New Jersey Horticultural Society will be held at the College building in New Brunswick on Monday, September 22d, beginning at ten o'clock. This is the fifteenth anniversary of the organization of this Society, and it is especially requested that all those who were present at the beginning, as well as those who have since been identified with the Society, should make an effort to be present on that occasion. The exercises will be interesting and an attractive exhibition is promised.

Although the double site selected for the Chicago Fair was contrary to the advice given by Mr. Frederick Law Olmsted, it is to be hoped that he will accept the position of Landscape Architect which was offered to him. So far as spectacular effect is concerned, it was folly, of course, to divide the ground, but a satisfactory plan can no doubt be arranged. As usual in such cases, the trouble from interference and opposition in carrying out the artist's ideas will probably be more serious than the difficulties in the natural conditions of the double site.

The most interesting plant at the last monthly exhibition of the Massachusetts Horticultural Society was a hybrid Cypripedium shown by Messrs. Pitcher & Manda, of Short Hills, New Jersey, and named Arnoldianum. The plant was particularly interesting since it has been raised within two years, which is probably the quickest time on record for the flowering of a hybrid Orchid from seed. This rapid development is more surprising since *C. concolor*, one of its parents, is a very slow grower. The other parent is *C. Veitchii*, and the hybrid shows the form and color of both parents in its flower.

Germany now counts nine schools of forestry, some of which at least are connected with her greatest universities; and that the professors who instruct in this branch are as highly honored as any is shown by the fact that the rectorship of the University of Munich is now held by Dr. Hess, Professor of Forestry, while last year his fellow at Giessen, Dr. Gayer, held the same position there. Only two forestry-schools exist as yet in Great Britain, one connected with the University of Edinburgh, and the other with the Indian Engineering College at Coopers' Hill under the control of the Government of India.

The phylloxera has invaded the Department of the Marne, whence comes all the French champagne. The Prefect of the Department has sent a report on the subject to the Minister of Commerce, which leaves no room for doubting the evil news. He says that the Vines over a stretch of country extending from Vincelles to Treloup have a pale yellow tinge instead of their natural green, and that the small fibrous roots are covered with nodosities. The Minister has sent Monsieur Douette, a professor of agricultural science, who studied the phylloxera in the south of France, to Epernay. He is instructed not to hesitate, if he judges well, to apply the Government rules for stamping out the disease. The Prefect says the whole country is terrified at the visitation. It is also reported that the phylloxera has appeared on the Rhine, and the vineyards at Mayence, Rudesheim, Bingen and other places are attacked and great alarm prevails among Vine-growers.

Mr. William Tricker writes that the flowers of *Nymphæa Mexicana*, which are now open in Staten Island, are much larger than those he took to the Boston Exhibition, and the plants are blooming more freely than those of Marliac's supposed hybrid, known as Chromatella. It will be remembered that Mr. C. G. Pringle, in our issue of August 27th, expressed a suspicion that this *N. Mexicana* is identical with *N. flava*. We hope that some one who has the good fortune to possess all three of these Water Lilies will take the pains to compare them and note their points of resemblance and difference under cultivation.

As an illustration of the influence of different soils and situations upon different kinds of Narcissus, the Rev. W. Wilks, Secretary of the Royal Horticultural Society, in a note on the Daffodil Conference, published in the Journal of the Society, says: One well known grower writes that Horsfield's variety never has given him one decent flower, although he has tried to grow it for a dozen years, while with Grandis and Empress he invariably succeeds. Another experienced grower writes that with him nothing equals Horsfieldii. The first grower lives on light, dryish, sandy loam, in the south of England, while the latter lives in the north, where rain is never a stranger and the soil is generally heavier.

A recent issue of the *Gardeners' Chronicle* contains an interesting account of the Alpine garden of Monsieur Boissier, which lies in a sunny nook in the Jura at an elevation of some 2,000 feet. The plants from high glacial regions flourish in the hot suns here because of the perpetual humidity which saturates the atmosphere from the evaporation of the abundant water which rushes down on every side. But damp as the air is, every provision is made to prevent the evaporation of moisture from the soil about the plants, and one of the means employed is worth notice. All the more tender species are surrounded by small stones, usually calcareous, and which, broken up into little pieces, cover the soil all round the plant. A splendid white flowered *Soldanella minima* was growing, covered with bloom, in a rock, which yet seemed excessively dry; this is a proof that these white stones scattered over the ground preserve the coolness and moisture of the soil, not only round the roots, but also round the aërial portion of the plant, the flowers and the leaves.

Mr. H. W. Wiley, the Chemist of the Department of Agriculture, has just published a bulletin concerning the cultivation of the Sugar Beet in the United States. The purpose of the bulletin seems to be to indicate the general principles which should be followed by those who intend to embark in this industry, and especially to prevent beginners from starting wrong and wasting time in an attempt to solve problems which have already been faced and overcome. From what is stated of the history of the industry in this country it appears that there have been many failures and few successes, and it is to be feared that the reports of remarkable profits in special instances may encourage many to enter into the business without adequate forethought and preparation. The methods of manufacturing sugar from the Beet have been so far perfected that there is no longer any need of public experiment in this branch of the business. The problem here is the agricultural one—that is, the selection of suitable soil under proper climatic conditions, and proper methods of planting, cultivating and harvesting the crop. In a general way, the coast valleys of California, and probably some large areas near the coast in Oregon and Washington, certain parts of the Dakotas and Nebraska, a few localities in Minnesota, Iowa, Michigan and northern Illinois, Indiana, Ohio and New York, seem to present favorable conditions for growing the Sugar Beet; but it is only in restricted areas where the conditions are exceptionally good even within these specified limits that we can hope for success. Many attempts have been made during the past twenty-five years to introduce this industry into the United States, and factories have been located in New England, Delaware, Illinois and California; but, with two exceptions, all these ventures have met with financial disaster. A factory at Alvarado, California, has been successfully operated for a number of years, and another one at Watsonville, in the same state, has been successfully operated for two years. From these successes it is reasonable to infer that others may succeed when all the proper conditions are supplied; but every attempt to erect a factory hurriedly or in a location where the capabilities of soil and climate are untried should be discouraged.